

References:

Thread_1: <https://www.clublexus.com/forums/ls-4th-gen-2007-2017/953199-valley-plate-leak-and-more.html>

Thread_2: <https://www.clublexus.com/forums/ls-4th-gen-2007-2017/998826-2010-ls460-awd-valley-pan-coolant-leak-part-numbers-and-service-manual.html>

Thread_3: <https://www.clublexus.com/forums/ls-4th-gen-2007-2017/998106-any-tips-for-doing-the-engine-valley-leak-repair.html>

For additional pictures (For LS600h See Post #371):

Thread_4: <https://www.clublexus.com/forums/ls-4th-gen-2007-2017/960290-project-ls600hl-for-cheap-24.html>

Required Parts:

Nomenclature:	Lexus PN:	Quantity:
Intake Manifold/Plenum gaskets	17171-38020	2
Valley Plate Sealant	08826-00100 or equivalent	1
Valley plate O-rings	96761-35035	2
Direct injector (high pressure fuel) connectors	90980-12117	Only if they break
Air/Oil separator plate	12215-38020	Only if it breaks/leaking

Optional Parts(While you're in there):

Nomenclature:	Lexus PN:	Quantity:
Throttle Body Gasket	22271-50050	1
PCV Valve	12204-38010	1
PCV Gasket	12273-38020	1
PCV Hose #1	12261-38030	1
PCV Hose #2	12262-38030	1
PCV Hose #3	12261-38040	1

You can also do the Valve Cover Gaskets/Spark plug grommets/HP fuel pump gaskets. Not covered in the scope of this document.

Required Tools:

Socket Set

Socket Extensions

Electrical pick set

Shop towels

Borescope/inspection mirror

Bungee cables / bendable wires (for supporting electrical harnesses)

Wet/dry shop vacuum (or equivalent)

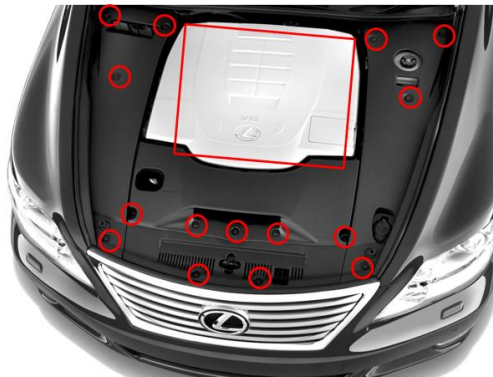
E-type Torx bit required

Torque wrench (7-15 ft/lbs)

Dish soap or O-ring compatible safe lubrication
Isopropyl Alcohol (91-95%)

Detailed Instructions:

1. Remove all engine covers/panels to gain access to engine compartment.



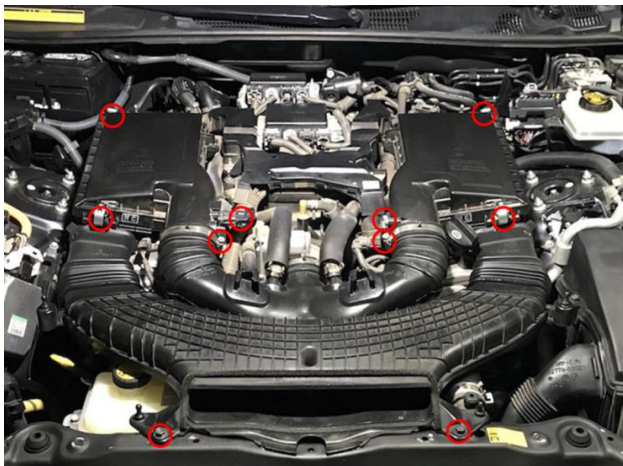
Engine covers/panels

2. Remove Intake System. Remove everything down to the throttle body.

NOTE

Draining the coolant system is optional. If coolant system is not drained excess coolant will spill when Valley Plate is removed.

3. Drain coolant system. Drain Radiator and open and drain two (2) block drains.



Top of intake system with covers/panels removed.

NOTE

Passenger side electrical harness connects down to the alternator. You do not have to remove these cables if you appropriately support the engine harness.

NOTE

If you want to remove the alternator connectors: The alternator needs to be loosened up to access it. Youtube has video for replacing alternator. For 2WD, there are 3 more connectors behind the alternator (closer to the fire wall): crankshaft position sensor, engine oil level sensor, and starter. The first two are easily accessible. The wire branching upward is connected to the starter. If you looks from the side of the car, the starter sits behind exhaust manifold and in-between them there is a heat shield. This one is difficult to disconnect, because it is difficult to see it directly unless the exhaust manifold and the heat shield are removed. Use a borescope to see where it is located at.

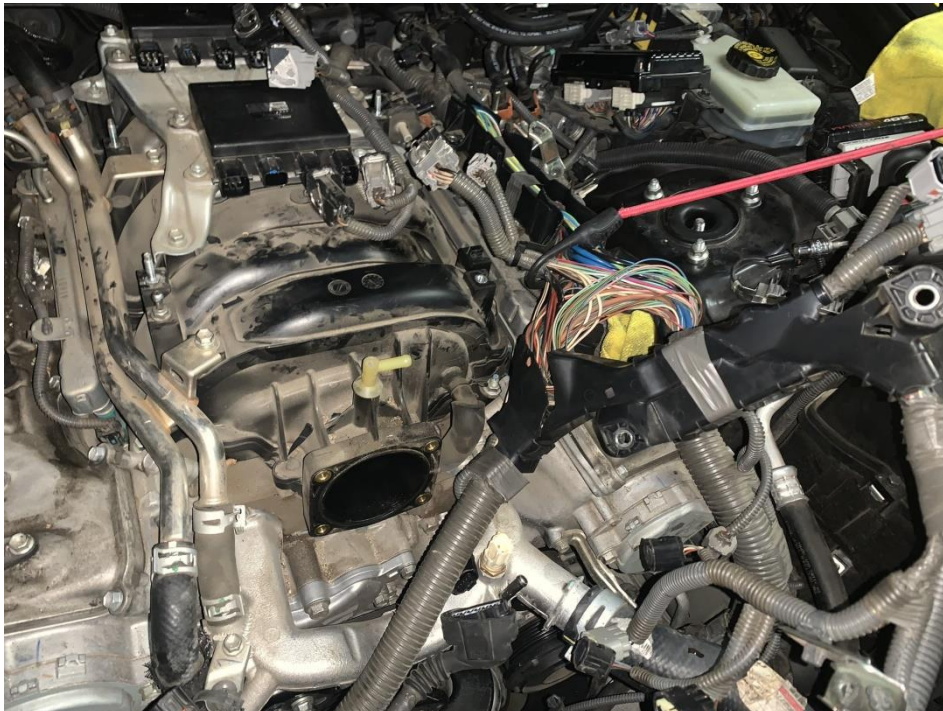
4. Remove electrical harness from top of Intake Plenum. See figures below for reference.



Removing the throttle body (which is optional – I think)



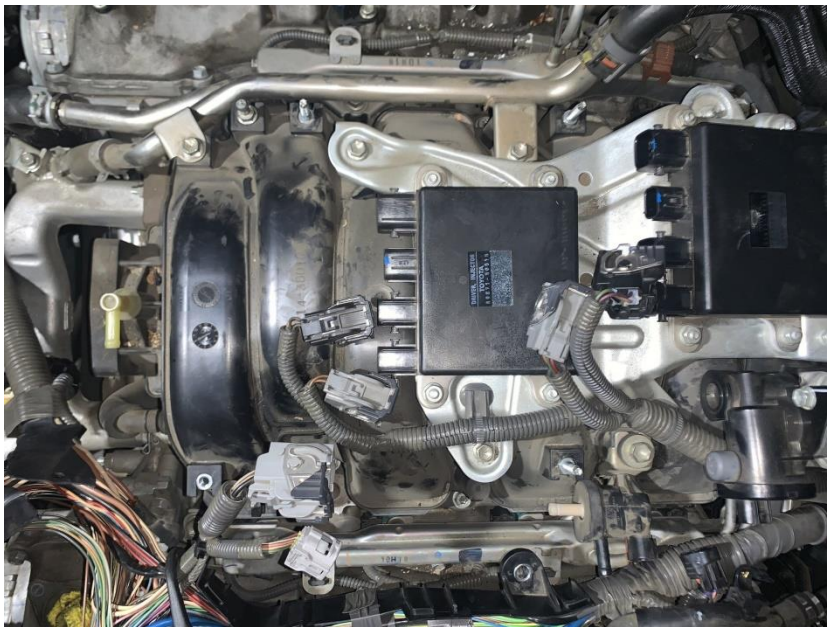
Removing the top electrical harness.



Main harness protector removed and supported with bungee cable (can remove the plastic protector to have more flexibility).



Drivers side view of the harness.

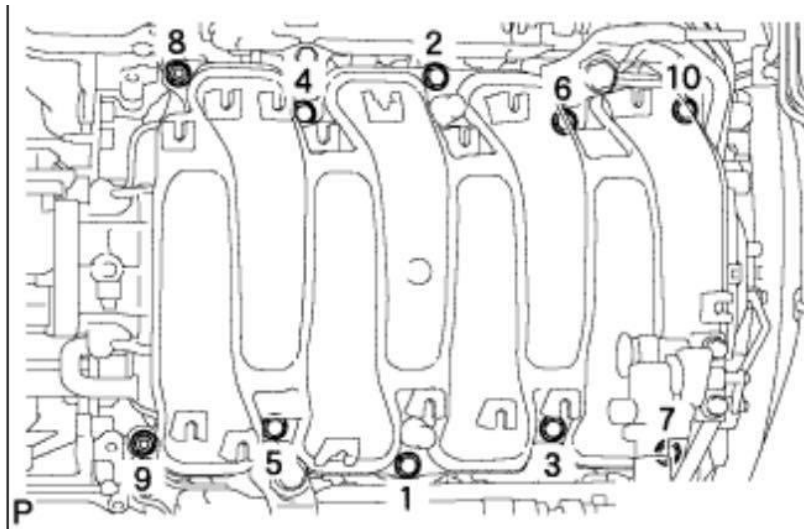


Top down view from drivers side.



Much further in process to show the passenger side electrical harness still connected to the alternator but moved for access. Note the passenger side plastic housing is removed in view.

5. Remove the intake manifold/plenum and throttle body assemblies from the engine block. See Figure for bolt location. Remove bolts in descending order starting with #10 first. Reinstallation torque is 21 N*m { 214 kgf*cm, 15 ft.*lbf }. Before reinstallation thoroughly clean intake and throttle body as required with isopropyl alcohol or equivalent. Remove and replace the Intake Manifold/plenum gaskets.



Bolt location/installation intake manifold/plenum torque sequence.

Engine
Foam



Intake removed from engine block.

CAUTION

Foreign Object Debris (FOD) can enter engine through exposed intake ports. Failure to remove FOD can cause damage to engine.

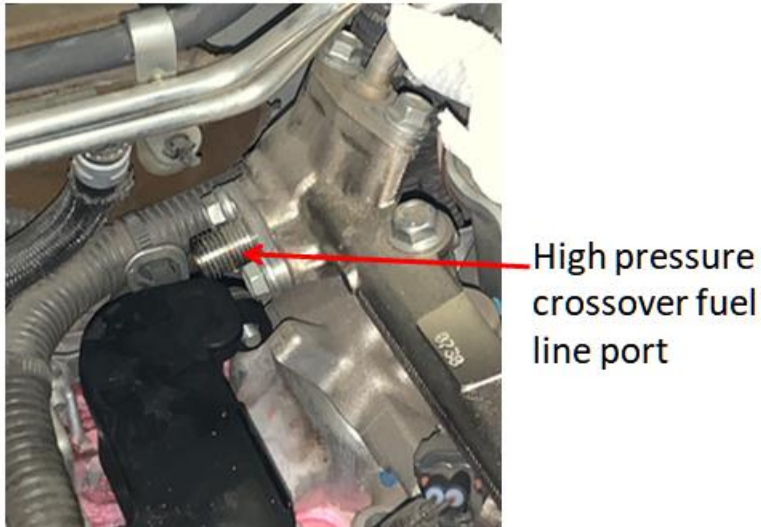
6. Cover intake ports with shop towels, masking/painters tape, or equivalent to reduce change of FOD damage.
7. Remove Engine foam from top of Air/Oil Separator.
8. Remove high pressure crossover fuel line.



High pressure
crossover fuel
line

Air/oil
separator

Top of air/oil separator.



Aft driver side near high pressure fuel rail.

9. Remove Air/Oil Separator. Reinstallation torque is 10 N*m { 102 kgf*cm, 7 ft.*lbf }.

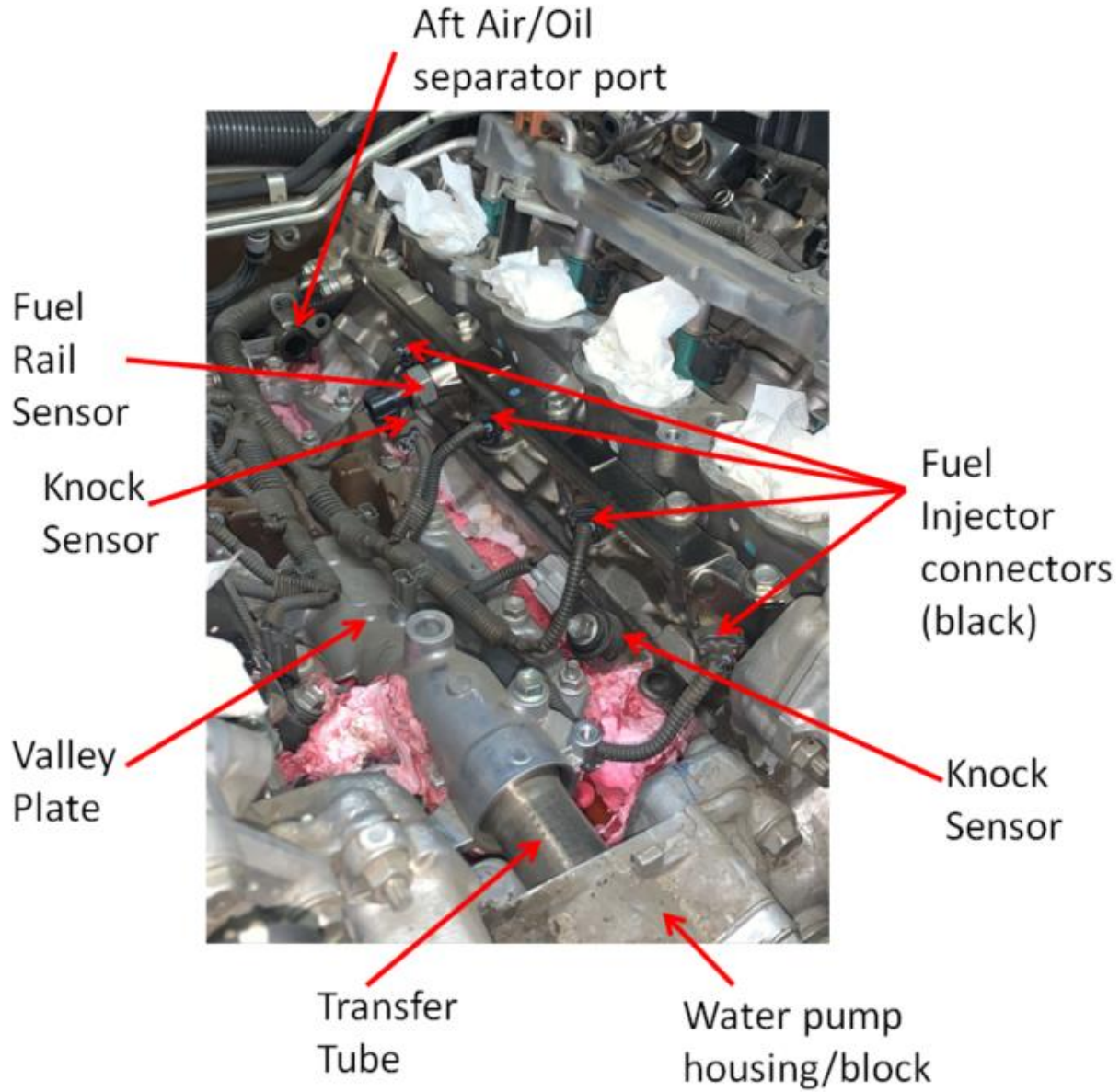
NOTE

High Pressure Fuel Injectors are fragile. Removal of connectors may cause the connector and/or Injector to break. (As best I understand) The connector can be repair without the removal of the fuel injector(s).

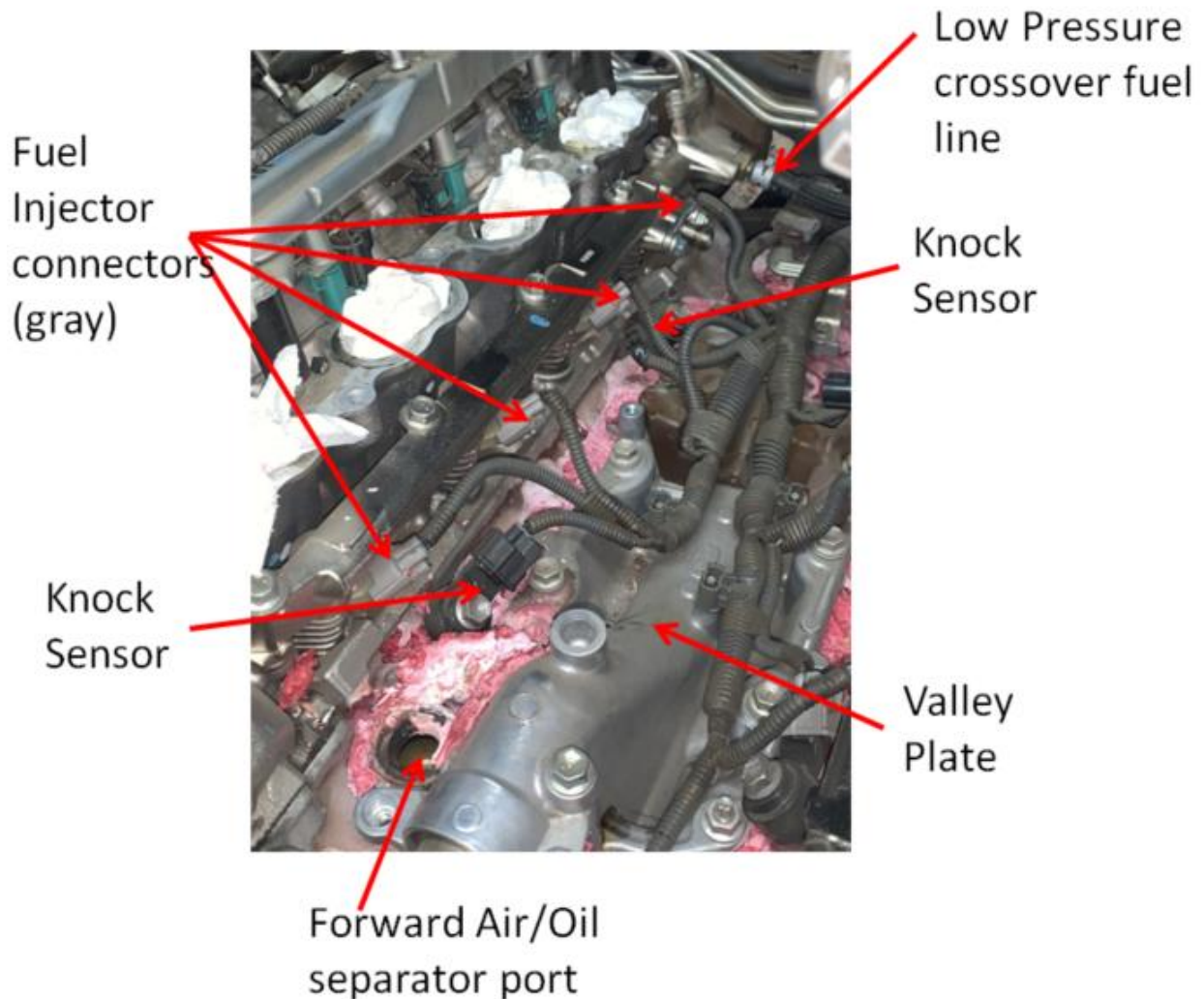
NOTE

High Pressure Fuel Injectors are color coded and need to be replaced exactly with the color they are. (Gray, Black, Brown, etc.)

10. Remove eight (8) High Pressure Fuel Injector electrical connectors. Take your time.



Driver side high pressure fuel rail.

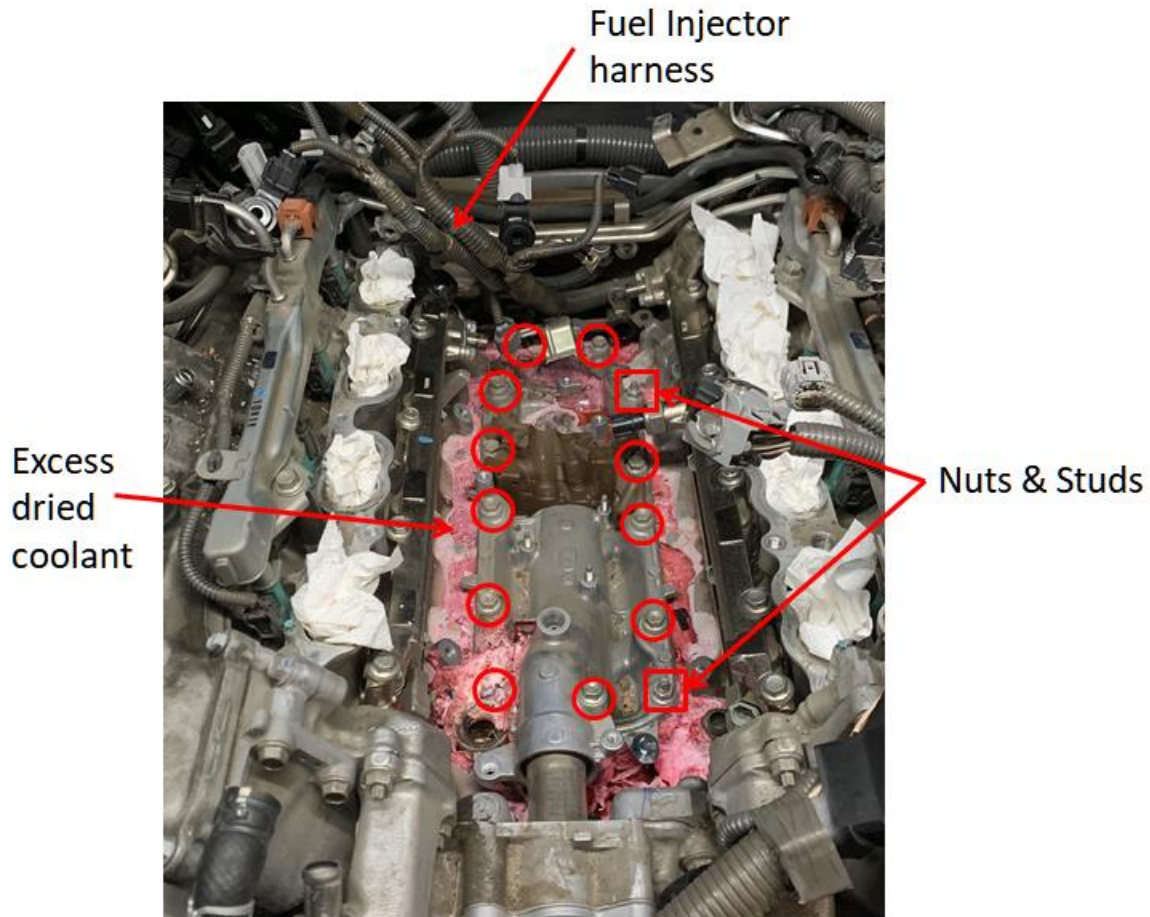


Passenger side high pressure fuel line.

CAUTION

RE-INSTALLATION OF KNOCK SENSORS IN INCORRECT POSITION MAY CAUSE ENGINE PERFORMANCE ISSUES. EACH SENSOR IS CALIBRATED TO ITS LOCATION.

11. Remove and retain four (4) Knock sensors. Record/Mark the order of each Knock Sensor. They are location dependent. Reinstallation torque is 20 N*m { 204 kgf*cm, 15 ft.*lbf }.
12. Remove and retain one (1) Fuel rail sensor.
13. Support high pressure fuel electrical harness and Low pressure fuel line to have access to top of Valley Plate.



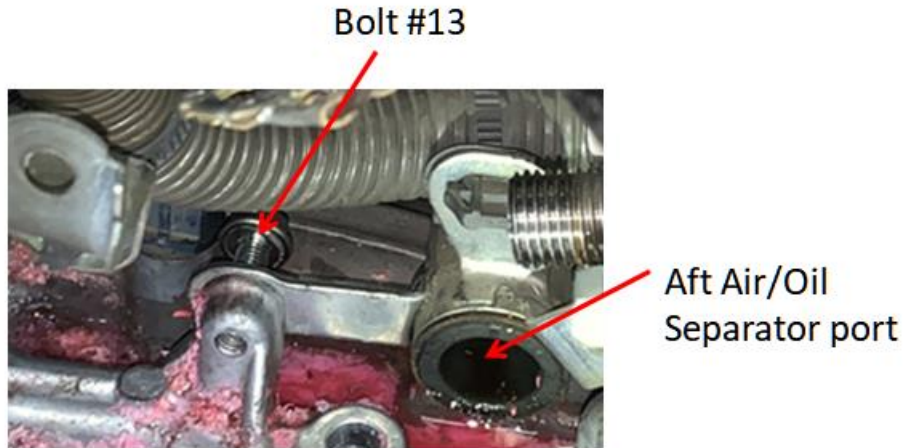
High pressure fuel electrical harness removed.

14. Remove eleven (11) screws attaching the valley plate to the block. (circles)

NOTE

Removal of the two (2) alignment studs is optional. You need an E-type torx bit to remove.

15. Remove two (2) nuts attaching the valley plate to the block.
16. Remove one (1) Bolt #13 attaching valley plate to electrical harness support brackets.



At aft most point of valley plate

CAUTION

COOLANT MAY SPLASH OUT DURING REMOVAL PROCESS. PROTECT YOUR EYES APPROPRIATELY.

17. Remove Valley Plate and Transfer Tube from block.



Valley Plate and Transfer Tube removed

18. Clean excess coolant and coolant residue from top of engine block. To remove hardened coolant, scrape with small screw or equivalent pick. Remove excess debris/liquid with

shop vacuum in and around the valley. Spray hot water or equivalent engine safe cleaner around the valley to remove caked on coolant then wipe clean.

19. Clean Valley Plate and Transfer Tube. To remove hardened coolant, scrape with small screw or equivalent pick. Remove excess debris/liquid with shop vacuum in and around the valley. Spray hot water or equivalent engine safe cleaner around the valley to remove caked on coolant then wipe clean. Discard old Transfer Tube O-rings.



Aft electrical
stud

Cleaned valley plate area

20. Remove aft electrical stud connector. E-type Torx bit required. Remove and retain rear stud from engine block to gain better access for valley plate re-installation.



Aft electrical stud

Removal of aft electrical stud.

NOTE

It is critical practice dry fitting the valley plate and transfer tube to ensure smooth installation. Support and remove any cables/hoses that interfere as required.

21. Support the passenger side of the Low Pressure crossover fuel line with zip tie to rear lines.



Supporting Rear fuel low pressure line

22. Use compressed air to remove excess coolant from all exposed screw holes on top of engine block.
23. Prepare bond line on top of block and on valley plate. Clean with isopropyl alcohol and clean lint free rag. Clean O-ring surfaces on transfer tube.

CAUTION

FAILURE TO LUBRICATE O-RINGS BEFORE INSTALLATION MAY RESULT IN A PINCHED O-RING THAT WILL CAUSE THE TRANSFER TUBE AREA TO LEAK.

24. Install two (2) new O-rings onto Transfer Tube. Use mild dish soap to lubricate O-rings before installation into Valley Plate and Water Pump Housing.
25. Install Transfer Tube assembly into Valley Plate.

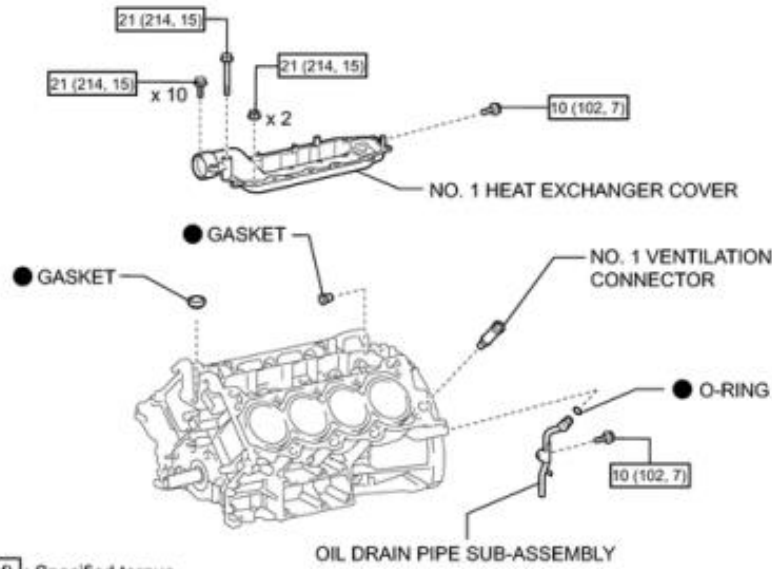
WARNING

EXPOSURE TO HAZARDOUS CHEMICALS IN NEXT STEP. PLEASE READ MSDS TO UNDERSTAND HAZARDS BEFORE HANDLING. USE THE PROTECTIVE SAFETY EQUIPMENT YOU WANT TO ENSURE LONG & HAPPY LIFE.

26. Apply Sealant onto valley perimeter. Ensure thick uniform 1/8 to 1/4 bead around perimeter. Continue to form bead around bolt holes to create a complete circle around each hole.
27. Install Valley Plate onto top of engine block. Ensure transfer tube O-rings are firmly engaged into Valley Plate and Water Pump housing. Inspect with mirror or borescope to ensure they are not rolled or pinched.



28. Install all eleven (11) screws and two (2) studs *if removed. Torque to 21 N*m { 214 kgf*cm, 15 ft.*lbf }. For screws/suds/nut reinstaLLation order recommended using cross-type installation/torque pattern. Refer to Intake manifold/plenum figure.



Installation and Torque diagram for Valley Plate (No. 1 Heat Exchanger Cover)

29. Install two (2) nuts onto the studs to secure Valley Plate. Torque to 21 N*m { 214 kgf*cm, 15 ft.*lbf }



Finished resealed Valley Plate

30. Reverse order of removal instructions to reinstall all components.